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Vol. 6, No. 12. WASHINGTON, D. C. July, 1937.

Agricultural Engineering.

Agricultural engineering and the new frontiers. By Philip S. Rose. Agricultural Engineering. v. 18, no. 6. June, 1937. p. 245-246, 250.

Agriculture.

Agricultural research through fifty years 1885-1935. St. Paul, Minn., 1936. 111 p. Minnesota. Agricultural experiment station. Bulletin 328.

Agricultural resources of Texas. By F.A. Buechel. Civil Engineering. v. 7, no. 7. July, 1937. p. 466-469.

Annual report for the fiscal year ending November 30, 1936. Amherst, Mass., 1937. 100p. Massachusetts. Agricultural experiment station. Bulletin no. 339. Agricultural engineering, p. 8.

Large scale and corporation farming: a selected list of references, compiled by Esther M. Colvin. Washington, D.C., 1937. 121 p. Mimeographed. U.S. Dept. Agriculture. Bureau of agricultural economics. Agricultural economics bibliography no. 69.

Air Conditioning.

Air distribution. By C. J. Braatz. Refrigerating Engineering. v. 33, no. 5. May, 1937. p. 305-306. Study of an important factor in air conditioning design.

Modern air conditioning. Refrigeration, Cold Storage and Air Conditioning. v. 3, no. 1. April 30, 1937. p. 25, 27-29. Discusses advances in ten years.

Outlook for ice in comfort cooling. By H. L. Lincoln. Refrigerating Engineering. v. 33, no. 5. May, 1937. p. 308-309. Combined use with evaporative cooling in a California development.

Plan now for cooled homes. Kansas Farmer. v. 74, no. 38. June 5, 1937. p. 6.

Study of summer cooling in Research residence using water at temperatures of 52 °F. and 46°F. By A. P. Kratz, S. Konzo and E. L. Broderick. Heating, Piping and Air Conditioning. v. 9, no. 6. June, 1937. p. 391-400. Part 2.

Alcohol Fuel.

Bill provides $1,000,000 for alcohol fuels. National Petroleum News. v. 29, no. 23. June 9, 1937. p. 16. Experimentation in "the development of renewable sources of fuel supplies of agricultural origin for internal combustion engines."

Political mathematics involved in alcohol-as-motor-fuel debate. By Arch L. Foster. National Petroleum News. v. 29, no. 23. June 9, 1937. p. 47-48.

Assessment.

Appraisal of farm lands. By P. L. Gaddis. Journal of Farm Economics. v. 19, no. 2. May, 1937. p. 401-415. In making an appraisal, appraiser will take following steps: (1) make study of unit in its setting, including trends in production, markets and home uses; (2) make complete inspection of property, carefully classifying land by type, utilization and production; (3) accurately measure, and determine utility of each building; (4) assign acre values and individual building values; (5) value unit as a whole; (6) carefully estimate farm income and expenses under present management and under typical operation; (7) check by rate of return to representative owner-operator and landlord; (8) check livestock units with carrying capacity; (9) check with type farms or other units appraised previously in this and other areas; (10) check with sales prices under different conditions, adjusted for abnormality; (11) check with opinion of sound and substantial farmers and business men of area; (12) make appropriate allowance in his asset value for any nonagricultural features.

Barns.

Streamlined barns hit Ohio. By R. A. Druyor. Hoard's Dairyman. v. 82, no. 8. April 25, 1937. p. 252.

Blasting.

Blasting with safety. By W. A. Rowlands. Madison, Wis., 1937. 24 p. Wisconsin. College of agriculture. Extension service. circular 288.

Building Construction.

Elements of building costs. Engineering News-Record. v. 118, no.18. May 6, 1937. p. 676-677. Tabulation is offered as check list for benefit of building estimator and contractor.

Era of wood is just arriving as uses for it increases. Popular Mechanics. v. 67, no. 1. January, 1937. p. 64. At Forest Products Laboratory at Madison, Wis., scientists are testing practicability of prefabricated houses of wood to be built by mass produc-

Building Construction. (Cont'd)

tion in factories, and erected complete in week or less. Laboratory also is improving methods of making joints and fastenings so timbers can be used more efficiently for bridges, arched halls and hangars. One advantage of wood is that it is renewable because we can grow successive crops. About 50,000,000,000 board feet of wood are used in United States annually. More than one-half this wood goes into building construction. Second largest use is for fuel and experts predict that by 1950 we will be using 25,000,000 tons of wood pulp each year, which is twice our present consumption.

How to build to save fuel. American Builder and Building Age. v. 59. no. 6. June, 1937. p. 76-77. Theoretical results based on nine construction combinations.

Concrete Construction.

Concrete floor for dairy barn is easy to construct. Oregon Farmer. v. 60, no. 11. May 27, 1937. p. 6.

How to make good concrete. By G. B. Hanson. Hoard's Dairymen. v. 82, no. 8. April 25, 1937. p. 244, 255. Table 1. Recommended proportions of water to concrete and suggested trial mixes intended primarily for use on small jobs.

Use of concrete on the farm. By T.A.H. Miller. Washington, D.C., 1937. 59p. U.S. Dept. of Agriculture. Farmers' Bulletin no. 1772.

Conservation.

Conservation thought advances. By T. C. Richardson. Farm and Ranch. v. 56, no. 7. April 1, 1937. p. 39, 50.

Range conservation and reclamation. By John C. Page. Montana Farmer. v. 24, no. 19. June 1, 1937. p. 5.

Corrosion.

Practical trial of roofing sheets. Indian Engineering. v. 101. no. 5. May, 1937. p. 169-170. Summary of corrosion tests.

Dairy Farm Equipment.

When the cheapest way is the best in milk cooling! By Morris H. Lloyd. Electricity on the Farm. v. 10, no. 7. July, 1937. p. 7-9.

Dams.

Small earthfill dams fail. Engineering News-Record. v. 118, no.25. June 24, 1937. p. 932. Small reclamation dam in Colorado fails when fill becomes saturated.

Diesel Engines.

Cavalcade of Diesel. By John B. Kennedy. (M.P.) Caterpillar Tractor Co., 1937. 24p.

Electric Service, Rural

Building load on rural lines. By H. J. Gallagher. C.R.E.A. News Letter. No. 15. May 1, 1937. p. 29-31.

Electric Wiring.

Low cost farm wiring. By S. A. Witzel. Hoard's Dairyman. v. 82, no. 8. April 25, 1937. p. 242, 254. Requirements for a successful farm electric wiring system are : (1) Wiring must be safe. (2) Electricity must be easy to use. (3) There must be enough of it. (4) Future expansion must be possible.

Electricity-Distribution.

Preliminary rural electrification survey. 2d ed. Topeka, Kans., Kansas emergency relief committee, 1935. 5 p. multigraphed.

Rural electrification moves forward. By M. J. Briggs. Hoosier Farmer. v. 22, no. 5. May, 1937. p. 16.

Rural electrification trends in Europe. By R. B. Gray. Agricultural Engineering. v. 18, no. 6. June, 1937. p. 259, 260.

Electricity on the Farm.

Cleaning the dairy barn by power. By C. G. Yarn. Electricity on the Farm. v. 10, no. 7. July, 1937. p. 13-14.

Electricity blows hot or cold. By H. N. Wells. American Agriculturist. v. 134, no. 8. April 10, 1937. p. 8, 19.

Electricity on a vegetable farm. By Walter G. Emerich. American Agriculturist. v. 134, no. 10. May 8, 1937. p. 1, 21.

Engineering analysis of electric uses on the farm. By E.A. White. C.R.E.A. News Letter. no. 15. May 1, 1937. p. 12-18.

Who will pump the water? By C. Samuels. Electricity on the Farm. v. 10, no. 7. July, 1937. p. 12.

Engineering.

Social responsibility of the engineer. Part 1. By F.G. Cottrell. Science. v. 85, no. 2214. June 4, 1937. p. 529-533.

Social responsibility of the engineer. Part 2. By F. G. Cottrell. Science. v. 85, no. 2215. June 11, 1937. p. 553-556.

Engines.

Better engine performance is S.A.E. meeting objective. Implement and Tractor. v. 52, no. 8. May 1, 1937. p. 16, 38, 40. Improved fuel injection, higher grades of lubricants and elimination of sludge are discussed.

Causes of engine wear. By W.W. Lawther. Implement and Tractor. v. 52, no. 13. June 26, 1937. p. 17. Dust and lack of lubrication are two main causes of wear. It is generally accepted that dust, in form of abrasives or foreign substances, is by far greatest factor contributing to wear. If dust is eliminated, wear can result from lack of lubrication, which includes insuffient quantity of oil, and rupture of oil film, permitting two surfaces to rub together. Wherever saving is not shown or wear continues at fast rate, some one or all of following points are true: (a) Air cleaner is not efficient in removing dust from ingoing air. (b) Installation permits dusty air to enter motor through leaks between air cleaner and cylinders. (c) Dusty air is entering crankcase through crankcase breather. (d) Dusty air is entering crankcase through road tube. (Note: During windstorms dust may be blown into motor through road tube.) (e) Dusty air is entering crankcase through leaks in crankcase, such as, past the seals, at front and rear ends of crankshaft, past oil bayonet gauge, past gaskets on cover plates and rocker arm cover, and past any stationary or rotating shaft, extending from crankcase or the timing gear cover. (f) Dirty oil being used, or dirt washed into crankcase with clean oil. (g) Failure of lubrication system to some extent. In order to reduce wear and prolong engine life, points mentioned above should be corrected by: (1) Use of a highly efficient oil type air cleaner. (2) Installing air cleaner so there are no leaks between air cleaner and cylinders. (3) Using crankcase breather of filter design. (4) Providing means for keeping dust from being drawn or blown into motor through road draft tube. (5) Providing some design of dust shield, because of constant air pressure and driving force of fan blast on seal at front end of crankshaft. (6) Every day we see service men using a measure which has stood exposed to every gust of wind, resulting in dust sticking to all oil-coated surfaces. (7) Lubrication failure can be caused by many things, but very seldom occurs if dust is not present.

Fuel injection pump application discussed at Peoria. Implement and Tractor. v. 52, no. 8. May 1, 1937. p. 17, 40. Four different engine types were considered as follows: - 1. Direct

Engines. (Cont'd)

injection engine, for which duration of injection must be short, atomization very fine, and penetration moderate. 2. Combination direct injection and air cell requiring fast injection. 3. Precombustion chamber without turbulence, requiring fairly fast injection with fair atomization, low penetration and fair control over rate of fuel entry. 4. Precombustion chamber with high turbulence functions best with a moderate injection duration.

Erosion Control.

Arkansas fights soil erosion. By Glenn Riddell. Arkansas Farmer. v. 39, no. 18. June 1937. p. 6-7.

Ditches reinforced with cotton resist weeds and erosion. Popular Mechanics. v. 67, no. 1. January, 1937. p. 47. Roadside drainage ditches, soil erosion control ditches, irrigation and malaria control ditches are all being built with cotton-reinforced asphalt lining.

Soil drifting control in the prairie provinces. By E. S. Hopkins, A.E. Palmer and W.S. Chepil. Ottawa, Can., 1937. 51p. Canada. Dept. Agriculture. Publication 568. (Farmers' Bulletin 32. 2d rev.)

Soil erosion and stream flow on range and forest lands of the upper Rio Grande watershed in relation to land resources and human welfare. By Charles K. Cooperrider and Barnard A. Hendricks. Washington, D.C., 1937. 88 p. U.S. Department of agriculture. Technical bulletin no. 567.

Soil erosion in Michigan orchards. By N. L. Partridge. East Lansing, Mich., 1937. 35p. Michigan. Agricultural experiment station. Circular bulletin 162.

Strip cropping for soil conservation. By Walter V. Kell. Washington, D.C., 1937. 37p. U.S. Dept. of agriculture. Farmers' Bulletin no. 1776.

Farm Buildings.

Arranging dairy stable. Hoard's Dairyman. v. 82, no. 8. April 25, 1937. p. 250.

Building better bull pens. Hoard's Dairyman. v. 82, no. 8. April 25, 1937. p. 241.

Housing farm machinery. Hoard's Dairyman. v. 82, no. 8. April 25, 1937. p. 261. Gives floor plan.

New buildings for old. The Farmer. v. 55, no. 10. May 8, 1937. p. 7. Illustrations.

Farm Machinery and Equipment.

Bright outlook for farm equipments. By Edwin A. Barnes. Magazine of Wall Street. v. 60, no. 2. May 8, 1937. p. 100-101, 129, 130.

Farm Equipment Institute's Statement on Prices. Implement Record. v. 34, no. 6. June, 1937. p. 20-21, 39. Prints facts and figures as submitted March 20, 1936, by Farm Equipment Institute to House Committee investigating farm machinery prices. These figures and statements have been based upon accurate information, and may serve as refutations to customer protests against high machinery prices.

Great gains by industry in 1936 shown by Census report. Implement and Tractor. v. 52, no.10. May 15, 1937. p. 19, 30. Table 1. Value of farm equipment and related products manufactured and sold, by classes: 1936, 1935 and 1931.

Implements and tractors use alloy cast irons. By Harold L. Geiger. Implement and Tractor. v. 52, no. 12. June 12, 1937. p. 14-18, 50. Table 1. Typical analysis of alloy cast iron implement and tractor parts. Table 2. General properties table for nickel cast iron parts used in implement and tractors.

Mechanical gapping. By H. I. Moore. British Sugar Beet Review. v. 10, no. 10. June, 1927. p. 299-300. One advantage of machine is that in a thin row operator can lift discs clear of row and so avoid chopping out plants which should remain. Saving in time.

Modern equipment for handling the 1937 hay crop. Research Dept. Farm Equipment Institute. Implement and Tractor. v. 52, no. 8. May 1, 1937. p. 30.

New combines harvest many crops. Research Department, Farm Equipment Institute. Implement and Tractor. v. 52, no. 10. May 15, 1937. p. 24.

New ways with hay. By Keith Gordon. Implement & Tractor. v. 52, no. 13. June 26, 1937. p. 16, 26.

New types of farm equipment and economic implications. By W. M. Hurst. Journal of Farm Economics. v. 19, no. 2. May, 1937. p. 483-487. Some effects of mechanization: (1) reduced labor requirements per unit of crop production; (2) reduced number of agricultural workers required for production of food; (3) increased acreage of harvested crops per worker; (4) increased investment and overhead cost of machinery per farm; (5) made available for other purposes considerable land formerly required for production of horse feed; (6) made farmer more dependent upon prices of farm commodities than when animals were chief source of power; (7) made him less dependent on itinerant labor.

Farm Machinery and Equipment. (Cont'd)

1936 implement production and sales. Farm Implement News. v. 58, no. 9. May 6, 1937. p. 22-26. Table 1. Value of product and volume of sales by classes, 1936, 1935 and 1931. Table 2. Principal items made and sold by number and value, 1936.

1937 Buyer's Guide. Chicago, Ill., Farm Implement News, 1937. 384 p.

Results of field studies of small combines. By W. M. Hurst and W. R. Humphries. Agricultural Engineering. v. 18, no. 6. June, 1937. p. 265-267. Conclusions: 1. In harvesting wheat and oats, threshing losses were somewhat lower for 5 and 6-foot combines than for those of 8-ft. and larger sizes. Cutter bar losses were slightly higher for small machine, with very little difference in total losses for the two size groups. Available information shows no significant difference in quality of small grain harvested with 5 and 6-ft. machines in comparison with those of larger sizes. 2. In harvesting soybeans 5 and 6-ft. combines gave slightly lower threshing losses, but somewhat higher cutter bar losses than 8-ft. and larger sizes. 3. Threshing unit in all sizes of combines tested appeared more effective in wheat and oats than separator, as much more threshed grain was thrown over the straw and chaff than unthreshed heads. 4. Small power take-off combines mounted on rubber tires are usually pulled at speed of from 0.5 to 1.0 mph. faster than machines equipped with auxiliary engine and steel tires.

Small combines for many crops. Kansas Farmer. v. 74, no. 38. June 5, 1937. p. 6. Combine owners claim that next to convenience and reduction in costs, most important advantage is benefit to soil of adding straw, which is spread uniformly over ground.

Texas honors James Oliver. Implement and Tractor. v. 52, no. 12. June 12, 1937. p. 46.

You can't raise good crops without proper tillage. By R. L. Cook. Michigan Farmer. v. 187, no. 11. May 22, 1937. p. 5, 18.

Farm Mechanics.

Farmer's shop book. Enlarged and revised. By Louis M. Roehl. Milwaukee, Wisc., Bruce publishing co., 1936. 471 p.

Using the farm level. By Charles Hobart. Arizona Producer. v. 16, no. 6. June 1, 1937. p. 25. Good instrument not expensive and its operation is not difficult.

Farm Power.

Efficiency of horses, men and motors. By S. Brody and E. A. Trowbridge. Columbia, Mo., 1937. 24p. Missouri. Agricultural experiment station. Bulletin 383.

Farm power problems: mule vs. tractor power on plantations. By E.L. Langsford. Journal of Farm Economics. v. 19, no. 2. May, 1937. p. 479-483.

Farm Tenancy.

Farm tenancy; report of the President's Committee. Washington, U.S. Government Printing Office, 1937. 108p. Prepared under the auspices of the National Resources Committee.

Farm tenancy in the United States. Prepared by the Agricultural Department Committee. Washington, D.C., U.S. Chamber of Commerce, 1937. 42p.

Farm Houses.

Encouragement of farm home ownership: Its place in a well-rounded tenancy program. By J. A. Baker. Land Policy Circular. v. 3, no. 5. June, 1937. p. 23-27.

Fences.

Ready reference fence guide. Pittsburgh, Pa., Pittsburgh steel co. 1937. 112p

Fertilizer Placement.

Place your fertilizer. By R. L. Cook. Michigan Farmer. v. 187, no. 10. May 8 , 1937. p. 5, 32.

Floods and Flood Control.

Changes in atmospheric circulation result in floods. By B. Holzman and K. Clarke-Hafstad. Soil Conservation. v. 2, no. 11. May, 1937. p. 254-255, 266.

Checking torrential floods. EngineeringNews-Record. v. 119, no.1. July 1, 1937. p. 22-24. Los Angeles County has spent $64,500,000 during the past twenty years on construction and engineering studies leading up to present federal works costing $20,000,000 which form but the initial stage of a $70,000,000 program.

Engineering and design for Los Angeles flood control. By R.E. Cruse. Military Engineer. v. 29, no. 166. July-August, 1937. p.282-287.

Flood flows of Texas Rivers. By C.E. Ellsworth. Civil Engineering. v. 7, no. 7. July, 1937. p. 493-496.

Floods and Flood Control. (Cont'd)

National aspects of flood control, - symposium: Discussion by Fred C. Scobey, Howard T. Critchlow, T.T. Knappen, M.C. Tyler, Gordon R. Williams, Arthur T. Safford, W.G. Hoyt, J.D. Arthur, jr., John H. Mcursinge, H. K. Barrows, E.D. Hendricks and Edward W. Bush. Proceedings of American Society of Civil Engineers, v. 63, no. 6. June, 1937. p. 1178-1207.

Structures to control torrents. By R.E. Cruse. Engineering News-Record. v. 119, no. 2. July 8, 1937. p. 67-73. Debris basins, detention dams, open and covered channels and channel crossings present a striking variety of flood-control structures in Los Angeles County.

Flow of Water.

Discharge over a free fall. By Walter B. Lanbein. Civil Engineering. v. 7, no. 5. May, 1937. p. 349-350.

Flow characteristics in elbow draft tubes: Discussion. By R. E.B. Sharp and L.F. Harza. Proceedings of American Society of Civil Engineers. v. 63, no. 6. June, 1937. p. 1143-1145.

Forage Crops - Drying

Fulmer process of artificial dehydration of forage crops. C.R.E.A. News Letter. No. 15. May 1, 1937. p. 31-34.

Foundations.

Anchored foundations prove worth in recent floods. American Builder and Building Age. v. 59, no. 6. June, 1937. p. 88, 90.

Let 'er blow! By Walter J. Hunt. Successful Farming. v. 35, no. 6. June, 1937. p. 16, 44. Discusses anchorage.

Fruit Storage.

Fruit is kept fresh for six months by air-gas control. Popular Mechanics. v. 67, no. 3. March, 1937. p. 403. That fruits and vegetables may be kept fresh from one growing season to another is goal of experimenters in Great Britain. Already it has been found that pears can be preserved without decay for periods up to six months, if oxygen and carbondioxide content of storage room be controlled properly. Food investigation board of department of scientific and industrial research in that country has set up laboratories in various parts of the empire to facilitate work along this line.

Refrigerated apple storages. By C.I. Gunness. C.R.E.A. News Letter. no. 15. May 1, 1937. p. 19-22.

Fruit Storage. (Cont'd)

Soft fruit storage and hold-over. By Frank H. Slade. Rural Electrification and Electro-Farming. v. 12, no. 145. June, 1937. p.306-309. Another practical application of electrical refrigeration on farm which will increase range of usefulness of existing fruit store is that of holding over and short period storage of soft fruits.

Fuels.

New aero engine fuels yield more power. Indian Engineering. v. 101, no. 5. May, 1937. p. 167. Will make possible an increase of aero engine output by no less than 30 per cent.

Relative knocking characteristics of motor fuels in service. By John M. Campbell. S.A.E. Journal. v. 40, no. 4. April, 1937. p. 144-150. In this investigation some of the under-lying principles affecting knocking characteristics of motor fuels in service have been studied.

Wood, bagasse, and refuse as sources of cheap heat. By F. W. Ellis. Southern Power Journal. v. 55, no. 5. May, 1937. p. 56-62. Valuable not because of any ideal fuel qualities that they may possess, but because their utilization obviates - or at least reduces - need for using more costly fuels, wood, bagasse and refuse provide cheap heat when available and usable. Table 1. Analysis and properties of various woods and waste fuels. Table 2. Combustion chart for dry wood.

Hay Storage.

Chopped hay storage in ventilated containers. By S.A. Witzel. Agricultural Engineering. v. 18, no. 6. June, 1937. p. 251-252. Paper presents report on experiments conducted in storing chopped hay with (1) varying percentages of moisture content, (2) different lengths of cut, and (3) in various types of ventilated containers.

Heat Transmission.

Thermal conductivity of materials used for solid carbon dioxide containers. By Ezer Griffiths and J. H. Awbery. Ice and Refrigeration. v. 92, no. 6. June, 1937. p. 393-395. Temperature difference between inside and outside of container used with solid carbon dioxide.

Heating.

Automatic stoker handles coal and ashes. Popular Mechanics. v. 67, no. 1. January, 1937. p. 17. Not only can you let automatic "hired man" shovel coal on your furnace fire, but he will carry out ashes as well. Mechanical stoker which feeds fuel and removes ashes

Heating. (Cont'd)

without raising dust through the house was exhibited recently at trade exposition in Chicago. An enclosed screw acts as feeder.

Houses, Remodeling

Remodeling the farm home. Hoard's Dairyman. v. 82, no. 8. April 25, 1937. p. 243, 251.

Hydraulics.

Results of experiments on hydraulics of drop inlets and other erosion control structures. By L.H. Kessler. Agricultural Engineering. v. 18, no. 6. June, 1937. p. 253-258. Ultimate object of work was to develop: 1. Type of spillway design that would give greatest discharge. 2. Outlet design that would safely dissipate energy in water before it was discharged from structure. 3. Standard designs of above items that would demand least amount of steel and concrete. 4. Standard designs that could be built by unskilled labor. 5. Preparation of hydraulic tables and charts for selection of size and type of spillway structure.

Hydroelectric Power.

29th annual report of the Hydro-electric power commission of Ontario for the year ended October 31, 1936. Toronto. T.E. Bowman, 1937. 517p.

21 per cent of Nation's water power developed. Power Plant Engineering. v. 41, no. 5. May, 1937. p. 303. Total capacity of water-wheels at water-power plants in the United States on January 1, 1937, according to annual report just released by Department of the Interior through Geological Survey, was 17,119,610 hp. an increase of 1,040,203 hp. during 1936, the largest since 1930 when it increased 1,076,889 hp.

Insect Control.

Protecting cherries from birds: a preliminary report. By H.A. Cardinell. East Lansing, Mich., 1937. 22p. Michigan. Agricultural experiment station. Circular bulletin no.160.

Uses of insect-electrocuting light traps. By W.B. Herms and J.E. Ellsworth. C.R.E.A. News Letter. No. 15. May 1, 1937. p. 25-29.

Insulation.

Insulation for low temperatures. By E.C. Lloyd. Refrigerating Engineering. v. 33, no. 5. May, 1937. p. 297-299. Notes on application, properties.

Irrigation.

Effect of soil moisture characteristics on irrigation requirements. By N.E. Edlefsen. Agricultural Engineering. v. 18, no. 6. June, 1937. p. 247-250. Engineering estimates as to practicability of proposed irrigation enterprises have too frequently been disappointing because nature of soil was not carefully studied. Soil moisture characteristics are phases of such investigation which have received little attention. Paper is report of a method used in making such survey.

For better irrigation. By K.K. Hennoss. Arizona Producer. v. 16, no. 6. June 1, 1937. p. 25. Land leveling means water penetration, bigger crops of higher quality.

Irrigated crop rotations at the Huntley (Mont.) field station, 1912-35. By Stephen H. Hastings and Dan Hansen. Washington, D.C., 1937. 38p. U.S. Department of Agriculture. Technical bulletin no.571.

Irrigating Prospect Valley. Implement and Tractor. v. 52, no. 10. May 15, 1937. p. 34. Irrigation was first started in the valley in 1914, when reservoir was built and water pumped into it by steam plants to provide large storage supply on community basis. Dam washed out first year with loss of crops and considerable damage. During next ten years, until 1924, there were several floods and no severe drought, so flood water was used for rather unstable supply. From 1924 to 1931 water was obtained from flowing creek, which then went dry and severe drought conditions made a serious situation. By any means of supply community system was inefficient and expensive. Network of ditches led to various farms, and water was turned into them as allotted. Man might not need water at time his turn came to take it, but he had to accept it as scheduled, so this system was unsatisfactory. It was also expensive as cost of such irrigation was up to $5.00 per acre foot. It was at this time that Caterpillar Diesel engines were first used in this district, pumping water dependably when and where it was most needed, and cutting irrigation costs from $5.00 to $2.00 per acre foot, with depreciation of equipment included.

Irrigation from pumped wells. By Winfield Holbrook. Civil Engineering. v. 7, no. 7. July, 1937. p. 473-474. Describes briefly various types of wells and pumps, and takes up questions of cost, relative merits of irrigation by wells, and its possible future development.

Irrigation of rice in the United States. By E. N. Gustafson. Civil Engineering. v. 7, no. 7. July, 1937. p. 501-503. Deals with engineering problems involved in production of rice - duty of water, and design of canals, levees, flumes and pumping plants. Gives some interesting facts about rice culture in general.

Irrigation. (Cont'd)

Measurement of irrigation water. By H.H. Kidder. Civil Engineering. v. 7, no. 7. July, 1937. p. 513-514. Describes various types of meters available for canals, and closed conduits, and emphasizes importance of extending their use.

Municipal sewage irrigation. By George A. Mitchell. Engineering News-Record. v. 119, no. 2. July 8, 1937. p. 63-66. Sewage irrigation farm scheme at Vineland, N. J., since 1928 provides facilities for 8,000 people, and aids crop production on poor soil.

Preparing for irrigation. By O.W. Monson. Montana Farmer. v. 24, no. 19. June 1, 1937. p. 8. Table gives carrying capacity of farm ditches.

Production requirements and costs on irrigated farms in Montana. By P.L. Slagsvold and Clyde Howard. Bozeman, Montana, 1937. 36p. Montana. Agricultural experiment station. Bulletin no. 338.

Use of eyelet hose in irrigation. Florida Grower. v. 45, no. 7. July, 1937. p. 2. Adaption of porous canvas hose.

When and how much tree water? By A.H. Hendrickson and F.J. Veihmeyer. Pacific Rural Press. v. 133, no. 11. March 13, 1937. p. 358.

Maps.

Map makers and map users. By William Bowie. Civil Engineering. v. 7, no. 4. April, 1937. p. 273-276. Conservation work, construction operations, and long-term planning projects could all be carried on more effectively if good maps were available. In addition employment would be given to many engineers, since untrained personnel can no longer produce acceptable maps. These are a few of the reasons why national mapping program should be pushed. Passing next to surveying methods, outlines modern procedure in map-making, which utilizes aerial photographs in addition to plane table and older surveying instruments. This well-reasoned and instructive article concludes with description of national control surveys, including basic considerations involved in making them, and various important uses for resulting data.

Milk Coolers.

Country milk-receiving and cooling stations. By C.E. Clement. Washington, D.C., 1937. 60p. U.S. Department of Agriculture. Circular no. 432.

Electric milk coolers appear. Kansas Farmer. v. 74, no. 38. June 5, 1937. p. 17.

Production of milk and cream of high quality. By G.H. Wilster. Corvallis, Oreg., 1937. 12p. Oregon. State agricultural college. Extension Service. Bulletin 502.

Milk Houses.

Milk houses of today. By S.A. Witzel. Hoard's Dairyman. v. 82, no. 8. April 25, 1937. p.240.

Planning for milk house efficiency. By J.H. Bodwell. Electrical Ruralist. v. 1, no. 3. July, 1937. p. 10, 23. Electric milk house designed for the New Hampshire small producer is proving very successful.

Miscellaneous.

Division of economic fibre production. Progress report of the chief officer R.J. Hutchinson for the years 1931 to 1933. Ottawa, Canada. 1935. Canada. Department of agriculture. Dominion experimental farms.

Humidity - and temperature-control cabinet for growing plants. By C.O. Grandfield, and Frank J. Zink. Journal of Agricultural Research. v. 54, no. 7. April 1, 1937. p. 503-508. Demand for experimental evidence on many problems requiring accurate control of temperature and humidity prompted construction of apparatus in which growing plants could be placed under as nearly natural light as could be obtained under controlled conditions. Use of cabinet may be extended to studies with soil-moisture control, thus providing equipment controlling three environmental factors that profoundly influence plant development.

List of periodicals currently received in the Library of the United States Department of Agriculture. Compiled by Elizabeth G. Hopper. Washington, D.C., Govt. Print. Office, 1936. 337p. U.S. Dept. of Agriculture. Miscellaneous publication no. 245.

Report on progress of the Works program. March 1937. Works progress administration. Washington, D.C., 1937. 145p. Multigraphed.

Rootbed versus seedbed. By G.D. Jones. Agricultural Engineering. v. 18, no. 5. May, 1937. p. 207-208. Seedbed is something in which seed will germinate or sprout, but not necessarily grow into full and fruitful plant. Rootbed is something in which roots of plants can expand and grow, and wherein energy is provided that will, through root system, provide necessary elements for growth of plants.

Painting.

Pointers on painting. Hoard's Dairyman. v. 82, no. 8. April 25, 1937. p. 246.

Plows.

Eighteenth-century crop husbandry in East Anglia (Norfolk, Suffolk and Essex.) By G.E. Fussell. Journal of the Ministry of Agriculture. v. 44, no. 1. April, 1937. p. 36-42. Gives illustration of Norfolk and Suffolk ploughs.

John Deere; he gave to the world the steel plow. By Neil M. Clark. Moline, Ill., Desauliners & Co., 1937. 61 p.

John Lane steel plow tradition. Farm Implement News. v. 58, no.12. June 17, 1937. p. 27-30. Review of historical evidence, much of it conflicting, and an effort to reconcile these statements.

Servicing the second-hand plow. By L.W. Hurlbut. Implement and Tractor. v. 52, no. 8. May 1, 1937. p. 21-22.

What's wrong with the plow? By H.C. Charles. Indiana Farmer's Guide. v. 93, no. 10. May 8, 1937. p. 23. Concerned only with hand or walking plow.

Poultry Houses and Equipment.

Range shelter for poultry. By J.B. Hayes. Hoard's Dairyman. v. 82, no. 8. April 25, 1937. p. 263.

Sanitation in the poultry yard. By N.R. Mehrhof. Florida Grower. v. 45, no. 7. July, 1937. p. 4. Advantages of summer shelters are: 1. For same amount of roosting space, summer shelter can be built much cheaper than ordinary colony house. 2. Summer shelter is more easily cleaned. 3. Summer shelter provides for more ventilation than can be obtained in ordinary house. 4. Summer shelter can easily be moved to clean ground, and this advantage is lost unless shelter is moved.

Pumps and Pumping.

Pumps for farm wells. By A.G. Tyler. St. Paul, Minn., 1937. 1p. Minnesota. College of Agriculture. Extension Division. Agricultural engineering news letter no. 63.

Common sense in pump selection. By Norman J. Radder. Electrical Ruralist. v. 1, no. 3. July, 1937. p. 4-5, 21. Good pressure water system is not only a convenience and a protection, but a labor saver and a means of increasing practically every important source of farm profit.

Rainfall and Run-off.

Rainfall intensities and frequencies: Discussion. By J.O. Jones, Charles W. Sherman, Glen N. Cox, Garrett B. Drummon, Eugene L. Grant, Adolph F. Meyer and Clinton L. Bogert. Proceedings American Society of Civil Engineers. v. 63, no. 6. June, 1937. p. 1121-1142.

Refrigerants.

Carbon dioxide in its new field of usefulness. By J.C. Goosmann. Ice and Refrigeration. v. 92, no. 6. June, 1937. p. 434-438. Horizontal versus vertical presses in their present highly developed form. A useful operating diagram illustrating time intervals for snow and slush formation, period of change in state, blowdown and discharge. Liquid freezing experimental and in practice.

Methyl chloride - a practical refrigerant measured by the theoretical ideal. By E.W. McGovern. Refrigerating Engineering. v. 34, no.1. July, 1937. p. 29-38.

Refrigerant hazards. By J.L. Mandeno. Refrigeration, Cold Storage and Air Conditioning. v. 8, no. 1. April 30, 1937. p. 19-22. 1. Tocicity. 2. Inflammability and explosiveness. 3. Speed of flame propagation. Comparative fire and explosion hazards.

Refrigeration.

Commercial refrigeration by low pressure steam. By G. F. Zellhoefer. Refrigerating Engineering. v. 33, no. 5. May, 1937. p. 317-318.

Refrigerate for health and profit. By Terry Mitchell. Electrical Ruralist. v. 1, no. 3. July, 1937. p. 1, 16.

Refrigerated gas storage of fruit. Ice and Refrigeration. v. 92, no. 6. June, 1937. p. 427-428. Development in the use of refrigerated gas storage for fruit in England.

Steam jet refrigeration. By J. C. Bertsch. Ice and Refrigeration. v. 92, no. 5. May, 1937. p. 315-317. Origin of process of steam jet refrigeration. Principles involved. Description of apparatus. Method of calculation. Efficiencies. Zero base steam tables.

Steam jet refrigeration. By J.C. Bertsch. Ice and Refrigeration. v. 92, no. 6. June, 1937. p. 390-392. Typical examples for compressions of 40 and 70 degrees with a single ejector, and with two ejectors in series. "Working chart zero base" for short cut calculations.

Steam jet refrigeration. By J.C. Bertsch. Ice and Refrigeration. v. 93, no. 1. July, 1937. p. 5-7. Three classes of applied refrigeration. The Follain three stage system. Illustrations of systems in vogue. Tabulated calculation of examples V and VI. Comparison of requirements for different systems.

Refrigeration on Cars, Trucks, etc.

New process for icing refrigerator cars. Ice and Refrigeration. v. 93, no. 1. July, 1937. p. 16. Two distinct phases: pre-cooling of car prior to its being loaded, and elimination of

Refrigeration on Cars, Trucks, etc. (Cont'd)

transit icing after car has been loaded and forwarded. Precooling step has been named hatch plug spray pre-chilling. It consists essentially in spraying sodium chloride brine at 15 °F. into tanks and allowing it to trickle down inside walls in thin film. After passing through tanks, brine is recovered and returned to a central cooling system for re-use.

New refrigerated truck body for handling meats. Ice and Refrigeration. v. 93, no. 1. July, 1937. p. 11-12. Ice provides low cost refrigeration in new type of truck body designed for handling fresh and smoked meats. Selected temperatures maintained.

Progress in ice and mechanical refrigerator cars. By George E. Hulse. Refrigerating Engineering. v. 34, no. 1. July, 1937. p. 9-15, 52. At present trend of development of cooling for refrigerator cars is away from systems which produce required refrigeration on the car, and towards retention of an arrangement by which refrigeration is furnished by a medium which is cooled in stationary refrigerating plant, and transferred to car to absorb heat and keep car at proper temperature.

Refrigerator Lockers.

Cold storage locker plants. By A. L. Blatti. Ice and Refrigeration. v. 92, no. 5. May, 1937. p. 371-374. Economic advantages and construction details of cold storage locker plants. Floor plans of typical plants.

Freezing storage of vegetables feasible for community lockers. Market Growers Journal. v. 60, no. 11. June 1, 1937. p. 28. Studies on freezing storage of vegetables have just been completed by investigators in Bureau of Plant Industry, who previously had shown that a considerable number of fruits may be preserved by freezing. Studies have shown varieties adapted to freezing storage and have standardized methods of preparation and packing, that, if carefully followed, will insure success.

Refrigeration lockers. Idaho Farmer. v. 55, no. 8. April 15, 1937. p. 3. Study of community refrigeration in state by Hobart Beresford and J.B. Rodgers, research assistant with Idaho committee on relation of electricity to agriculture, reveals that there are 24 community refrigeration plants in Idaho, 16 in southern Idaho and 8 in northern Idaho, about half of which are cooperatively owned. The number of individual storage lockers per enterprise ranged from 24 to 1,000, average number being 330. On basis of their survey Beresford and Rodgers estimate that between 8,000 and 10,000 refrigeration lockers are available in Idaho. Average-sized locker measures approximately 24 x 24 x 30 inches.

Refrigerators.

Improvements in household refrigerators. By E.B. Newill. Refrigerating Engineering. v. 34, no. 1. July, 1937. p. 24-25.

Refrigerators.

New types of farm refrigerators, and how they are used. By Mack Tucker. Air Conditioning and Refrigerating News. v. 21, no.7. June 16, 1937. p. 6. Requirements for farm refrigerator design: 1. Low cost (no frills). 2. Ample capacity. 3. High usage value. 4. Package type recommended (easy to install). 5. Simple in design.

Rio Grande.

Rectification of the Rio Grande. By L.M. Lawson. Civil Engineering. v. 7, no. 7. July, 1937. p. 457-461. By the Gadsen Treaty of 1853 between United States and Mexico, the "deepest channel" of Rio Grande was fixed as international boundary from El Paso to Gulf. But gradual and avulsive changes have since occurred so frequently in that river that Secretary of State, acting through American boundary commissioner, was recently authorized by Congress to make studies leading to rectification of its channel in line with provisions of Treaty of 1933. Mexican section of International Boundary Commission has made valuable contributions to this work, now well advanced, and has cooperated ably with United States section. Other activities of Commission described herein are flood-control work on lower Rio Grande and at Nogales: construction of concrete diversion dam and connecting canal near El Paso; solution of international sanitation problems, notably on Tijuana River; surveys along international boundary including elimination of "bancos"; and collection of hydrographic data on watershed of Rio Grande.

Problems of the upper Rio Grande. By M.M. Kelso. Land Policy Circular. v. 3, no. 5. June, 1937. p. 19-22.

Roadside Stands.

Suggestions for agricultural roadside stands. By L.A. Dougherty. Durham, N.H., 1937. (8p.) New Hampshire university. Extension service. Circular 194.

Silt.

Advance report on the sedimentation survey of Lake Bracken. Galesburg, Illinois. By Victor H. Jones. Washington, D.C., 1937. 10 p. mimeographed. U.S. Dept. of Agriculture. Soil conservation service.

Advance report on the sedimentation survey of Lake Calhoun, Galva, Illinois. By Louis M. Glymph, jr., and Victor H. Jones. Washington, D.C., 1937. 9p. Mimeographed. U.S. Dept. of Agriculture. Soil conservation service.

Silt.

Advance report on the sedimentation survey of Loy Reservoir, Canton, Alabama. By Farrell F. Barnes. Washington, D.C., 1937. 13p. Mimeographed. U.S. Dept. of Agricultural Soil Conservation Service.

Advance report on the sedimentation survey of West Frankfort Reservoir, West Frankfort, Illinois. By Victor H. Jones. Washington, D.C., 1937. 9p. Mimeographed. U.S. Dept. Agriculture. Soil Conservation Service.

Sedimentation in a small artificial lake. Science. v. 85. no. 2209. April 30, 1937. p. 426-427.

Spray Removal.

Removal of spray residue from apples. By R. H. Reed. Agricultural Engineering. v. 18, no. 6. June, 1937. p. 261-264, 267. No attempt made to present complete results secured at Illinois Agricultural Experiment Station in its projects on residue removal. Object of paper is to present basic results secured in projects, and, in addition, some of methods used and results obtained which could not be included in regular publications.

Terracing.

Biggest complaint about terraces. By Tudor Charles. Kansas Farmer. v. 74, no. 38. June 5, 1937. p. 3, 23.

Tires.

Rubber tires save fuel. Montana Farmer. v. 24, no. 19. June 1, 1937. p. 5, 27. Summary of experiments. 1. In fuel consumption differences were small for various series of tests with rubber tires, but decreased slightly with increase of wheel weights. 2. Fuel consumption with heavy loads decreased slightly when inflation pressure was decreased. 3. Fuel consumption was less with rubber tires than with steel wheels by from 1-6 to 2-5 of gallon per hour, or about 5 to 8 per cent less for rubber tires; there was some variation with load. 4. Increase in drawbar pull decreased speed, this decrease being more rapid with lower wheel weights. 5. Maximum drawbar pull and horsepower were higher with large rubber tires. 6. Maximum drawbar pull varies slightly with inflation pressure. For high inflation pressures maximum drawbar pull is lower than for lower pressures. 7. Maximum practicable drawbar pull was about same in all gears with rubber tires. 8. Maximum horsepower with rubber tires was greater in higher gears. 9. Addition of wheel weights with rubber tires increased both maximum drawbar pull and horsepower. 10. Maximum drawbar pull with steel wheels was greater for lower gears. 11. Maximum horsepower was about the same for all gears with steel wheels. 12. Maximum

Tires. (Cont'd)

drawbar pull and horsepower with large rubber tires were higher than for steel wheels, while for small tires they were less, but differences were not great. 13. Slip with rubber tires was generally higher than with steel wheels and lugs, except at lower inflation pressures, and with higher amount of wheel weights. 14. Slip with rubber tires was greater with higher inflation pressures. 15. Slip was less with larger wheel weight. 16. Rate at which slip increased with increase in drawbar pull was less with large rubber tires than with small tires. 17. In high gear tractor pulled larger loads when equipped with rubber tires than with steel wheels.

Use water to inflate tires. Michigan Farmer. v. 187, no. 11. May 22, 1937. p. 9. Use of water provides normal cushioning without rebound or bouncing of tractor or other equipment. They give tractor greater tractive ability and better riding qualities.

Water in tires. Arizona Producer. v. 16, no. 4. May 1, 1937. p. 17. Not always satisfactory substitute for weights, say tractor operators.

Tractors.

Choosing proper size of tractor for a "baby" combine. By L. W. Hurlbut. Implement and Tractor. v. 52, no. 12. June 12, 1937. p. 27, 31.

Displacement of horses and mules by tractors. By Martin R. Cooper. Farm Implement News. v. 58, no. 13. July 1, 1937. p. 37. During last 18 years combined number of horses and mules of all ages on farms has decreased at average rate of about 2.2 per cent per year. On January 1, 1937, there were 16,130,000 horses and mules on farms compared with 26,436,000 head on January 1, 1919. This decrease of nearly 40 per cent has been concurrent with expanding use of tractors, motor trucks and automobiles, which, together with further development of tillage and harvesting machinery, has made possible handling of acreage of crops somewhat larger than acreage of 10 or 15 years ago.

Power problem in relation to farm business. By J.A. Hodges. Journal of Farm Economics. v. 19, no. 2. May, 1937. p. 487-492. Table gives advantages and disadvantages of tractor power.

Traction and speed! Kansas Farmer. v. 74, no. 38. June 5, 1937. p. 1. What rubber tires will add to your tractor farming.

Tractors back to 1929 record. Better Farm Equipment and Methods. v. 9, no. 9. May, 1937. p. 6-7. 1936 production nears all-time high record. "All-purpose" models account for 70% of production.

Ventilation.

Ventilation of dairy barns. Hoards Dairyman. v. 82, no. 8. April 25, 1937. p. 239, 256.

Water, Underground

Investigating ground water resources. By Samuel F. Turner. Civil Engineering. v. 7, no. 7. July, 1937. p. 487-490.

Study of influence of depth of ground-water level on yields of crops grown on peat lands. By H.B. Roe. St. Paul, Minn., 1936. 32p. Minnesota. Agricultural experiment station. Bulletin 330.

Water Heating.

Heating water electrically. By H.S. Nonneman. Electrical Ruralist. v. 1, no. 3. July, 1937. p. 11. Points in favor of electric hot water heater over other types of fuel heaters: 1. Absence of open flame, eliminating all possibility of fire. 2. Absence of explosive gas or liquid. 3. No pilot light to go out and possibly cause explosion or fire. 4. No fumes that may get into house and possibly cause asphyxiation of occupants. 5. Requires no attention or adjustment on part of owner. 6. With many "off peak" rates an electric hot water heater can be operated as economically as other fuels. 7. Uniform water temperature.

Water Supply.

Desert water tanks. By Glenton G. Sykes. Engineering News-Record. v. 119, no. 1. July 1, 1937. p. 36-37. Storage basins composed of gravel and sand confined behind small dams have been in use for more than a century to conserve water in semi-arid regions of the Southwest.

Local control survey; report on stream gaging stations in Massachusetts with notes on equipment and operation. Boston, Mass., 1935. 63 p. Mimeographed. U.S. Geological Survey.

Planned utilization of water resources. By Arthur E. Morgan. Civil Engineering. v. 7, no. 4. April, 1937. p. 255-259. Public control of water resources for public good is a concept that is growing steadily in United States, together with realization of advantages to be gained by coordinating and unifying development for all of various water usages. But federal and state legislation is first necessary to permit formation of organizations with authority to undertake such unified development. Dr. Morgan suggests that this legislation may take form of constitutional amendment or interpretation, organization of interstate water-control districts, or compacts between states.

Water Supply.

Water needs of southern San Joaquin. By D. J. Whitney. California Cultivator. v. 84, no. 12. June 5, 1937. p. 417.

Water resources of Texas. By John W. Pritchett. Civil Engineering. v. 7, no. 7. July, 1937. p. 462-466. Outlines general situation with regard to water supplies and explains reasons which led Texas Legislature to adopt policy of coordinated development of entire watershed as a unit for each of state's major streams.

Work of the Board of water supply, a general description of the Catskill water supply and of the project for an additional supply from the Delaware river watershed and the Rondout creek. New York City. Beacon press, inc., 1936. 47p. New York City. Board of Water Supply.

Water Supply, Rural

Here are two water systems. Oregon Farmer. v. 60, no. 8. April 15, 1937. p. 18. Practical suggestions for average farm home.

Watersheds.

Organizing for watershed development. By T.C. Forrest, Jr., Civil Engineering. v. 7, no. 7. July, 1937. p. 490-493.